REMARKS/ARGUMENTS

Request for Continued Examination:

The applicant respectfully requests continued examination of the above-indicated application as per 37 CFR 1.114.

Amendments to the Claims

Claims 1, 4, and 7 have been amended to clarify that the portion of the first signal is subtracted from the first signal, which is fully supported by specification paragraph [0041] teaching that a portion of the in-phase signal I with the value of ($\sin\Delta\ \phi$) is **subtracted from the in-phase signal I** and is used for compensating the quadrature signal Q. The applicant therefore believes that the amendments made to claims 1, 4, and 7 introduce no new matter.

Claims 14 and 15 have been amended to more clearly define that the complex filter is for processing image cross talk, which is fully supported by the specification paragraphs. No new matter is introduced.

Consideration of above-identified claim amendments is respectfully requested.

Claim Rejections

Claims 1-3, 7-10, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Wynn (US Patent 6,009,317) for the same reasons as set forth in the last office action.

Response:

Claim 1

In the Office action dated 06/27/2007, Examiner states that in Wynn figure 3 the phase correction is a function of both the I and Q signals. The applicant points out that Wynn's phase correction fails to teach the claimed feature "**modifying** the second signal by **the portion of the first signal**".

In col. 7, lines 51-56, Wynn teaches that the phase angle of the received complex signal is calculated according to the known trigonomic principle, the inphase signal, and the quadrature signal, i.e., $\phi = \tan^{-1}(Q/I)$. Wynn however fails to teach or suggest using a portion of the inphase signal or quadrature signal to compensate the phase angle of the

received complex signal. Additionally, Wynn teaches that a phase-to-frequency processor is to convert the phase angle ϕ into a frequency, and then a balancing processor is to detect the quadrature imbalance between the inphase signal and the quadrature signal according to the demodulated frequency generated from the phase-to-frequency processor (col. 7, lines 60-64; and col. 8, lines 4-8). In other word, Wynn does teach that the phase angle is a function of I and Q signals; however, Wynn fails to teach or suggest that a portion of the inphase signal or quadrature signal is used for compensating the phase imbalance. In view of the above statements and the arguments submitted in the previous replay dated 05/09/2007, the applicant asserts that the claimed limitation of **modifying** the second signal by **the portion of the first signal** is neither taught nor suggested by the phase correction taught by Wynn. (*emphasis added*)

Furthermore, claim 1 in the instant reply has been amended to specify that the portion of the first signal is subtracted from the first signal and is utilized for compensating the second signal, implying that both of the in-phase signal and the quadrature signal are adjusted by the same signal amount, i.e., the portion of the first signal. The applicant asserts this claimed feature is not anticipated by Wynn.

In light of above reasons, the applicant therefore asserts that claim 1 should be found patentable over Wynn.

Claim 2

Claim 2 is dependent upon claim 1, and should be allowed if claim 1 is found allowable.

Claim 3

Claim 3 was cancelled in the previous reply dated 05/09/2007.

Claim 7

In light of above statements, the applicant believes that the claimed features in claim 7 are not anticipated by Wynn, and claim 7 has overcome the rejections under 102(b) accordingly.

Claim 8

Claim 8 was cancelled in the previous reply dated 05/09/2007.

Claims 9, 10, and 13

Claims 9, 10, and 13 are dependent upon claim 7, and should be allowed if claim 7 is found allowable.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317) in view of Jeong (US Publication 2003/0095589 A1) for the same reasons as set forth in the last office action.

Response:

Claim 4

In light of above statements, the applicant asserts that the claimed step of utilizing the programmable phase calibration device to reduce the phase mismatch in the pair of quadrature signals through **subtracting** a portion of the first signal from the first signal and **modifying** the second signal by **the portion of the first signal** is not anticipated by Wynn. (*emphasis added*) Therefore, in view of above statements and the arguments submitted in the previous reply dated 05/09/2007, the applicant therefore asserts that the above-identified feature is neither taught nor suggested by combined teachings of Wynn and Jeong, and claim 4 has overcome the rejections under 35 U.S.C. 103(a).

Claim 5

Claim 5 is dependent upon claim 4, and should be allowed if claim 4 is found allowable.

Claim 6

Claim 6 was cancelled in the previous reply dated 05/09/2007.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317) and Jeong (US Publication 2003/0095589 A1), and further in view of Underwood wt al. (US Patent 4,937,535) for the same reasons as set forth in the last office action.

Response:

Claim 11

Claim 11 was cancelled in the previous reply dated 05/09/2007.

Claim 12

Claim 12 is dependent upon claim 7, and should be allowed if claim 7 is found allowable.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Glas (US Patent 6,330,290 B1).

Response:

Claim 1

As illustrated in Fig. 2 and stated in col. 5, lines 51- Col. 6, line 2 of the specification, Glas discloses that one compensating unit (102) is configured to multiply the output signal provided by A-D converter (27) by a factor β, the other compensating unit 104 is configured to multiply the output signal provided by A-D converter 27' by a factor α, and the outputs of the compensating units (102, 104) are added by the adder (106) for compensating the amplitude and phase imbalance. The calibration operations are represented by equations (18a)-(21b) listed in col. 9 of Glas' specification. As the in-phase signal is not adjusted during the calibration process according to equations (18a), (19a), and (21a), the applicant asserts that the claimed feature "**subtracting** a portion of the first signal from the first signal" is not anticipated by Glas. (*emphasis added*) Therefore, claim 1 should be found patentable over Glas.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317), in view of Glas (US Patent 6,330,290 B1), and further in view of Jeong

(US Publication 2003/0095589 A1).

Response:

Claim 4

In light of above statements, the applicant asserts that the claimed limitation "utilizing the programmable phase calibration device to reduce the phase mismatch in the pair of quadrature signals through **subtracting** a portion of the first signal from the first signal and **modifying** the second signal by **the portion of the first signal**" is neither taught nor suggested by the combined teaching of Wynn, Glas, and Jeong. Therefore, claim 4 should be found patentable over the prior art.

Claim 5

Claim 5 is dependent upon claim 4, and should be allowed if claim 4 is found allowable.

Claims 7, 9-10, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317), in view of Glas (US Patent 6,330,290 B1).

Response:

Claim 7

In light of above statements, the applicant asserts that the claimed limitation "**subtracting** a portion of the first signal from the first signal" is neither taught nor suggested by the combined teaching of Wynn and Glas. (*emphasis added*) Therefore, claim 7 should be found patentable over the prior art.

Claims 9, 10, and 13

Claims 9, 10, and 13 are dependent upon claim 7, and should be allowed if claim 7 is found allowable.

Claim 14

Claim 14 has been amended to clarify that the claimed complex filter can process image cross talk caused by mismatch between the first signal and the second signal.

However, Wynn fails to teach or suggest, implicitly or explicitly, that the filters (82, 84) in Fig. 3 have the functionality of processing image cross talk caused by mismatch between the inphase signal I and the quadrature signal Q. The applicant asserts that the claimed feature directed to the complex filter is not taught or suggested by the combined teaching of Wynn and Glas. In addition, claim 14 is dependent upon claim 7, and should be allowed if claim 7 is found allowable.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317) and Glas (US Patent 6,330,290 B1), as applied to claim 7 above, and further in view of Underwood et al. (US Patent 4,937,535).

Response:

Claim 12 is dependent upon claim 7, and should be allowed if claim 7 is found allowable.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317).

Response:

As admitted by Examiner, Wynn does fail to teach or suggest a complex filter having input ports electrically connected to the amplitude calibration module. However, Examiner deems that it would have been obvious to one of ordinary skilled in the art to have placed the filters at the output ports of Wynn's amplitude calibration modules. To more clearly define the claimed features, claim 15 has been amended to clarify that the claimed complex filter can process image cross talk caused by mismatch between the first signal and the second signal. Additionally, in specification paragraph [0056], the applicant states, "The calibration detector 56 is connected to two output ports of the complex filter 38 to detect the processed signal repeatedly calibrated by the programmable phase calibration device 48 and the second programmable amplitude calibration device 46. In this embodiment, the calibration process is not finished until the lowest image cross-talk level is found". Therefore, the calibration for the amplitude mismatch or phase mismatch is not always completed in a single round due to the fact that applicant's calibration

avoids the use of complex analysis and algorithms. The advantage of placing the complex filter at the output ports of the calibration module is to further reduce the image cross talk if the calibration module does not have the optimum setting yet.

In light of above reasons, the applicant asserts that the claimed limitation directed to the complex filter is not obvious to one of ordinary skill in the art after reading the Wynn reference.

Clams 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Ozluturk et al. (US Publication 2002/0110201 A1).

Response:

Claim 1

As clearly shown in Fig. 3 and stated in specification paragraphs [0038], Ozluturk discloses that **a portion of Q component** (i.e., ry) is subtracted from the **I component**, and **a portion of I component** (i.e., xr) is subtracted from **the Q component**. However, the applicant points out that Ozluturk fails to teach or suggest that the portion of I component is subtracted from the same I component or the portion of Q component is subtracted from the same Q component, and the portion subtracted from one of the I component and the Q component is used for adjusting the other of the I component and the Q component. Therefore, the claimed features "**subtracting** a portion of the **first signal** from the **first signal**" and "**modifying** the **second signal** by **the portion of the first signal**" are neither taught nor suggested by teachings of Ozluturk. (*emphasis added*) Claim 1 should be found patentable over Ozluturk.

Claim 2

Claim 2 is dependent upon claim 1, and should be allowed if claim 1 is found allowable.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317), in view of Ozluturk et al. (US Publication 2002/0110201 A1), and further in view of Jeong (US Publication 2003/0095589 A1).

Response:

In light of above statements, the applicant asserts that the claimed limitation "utilizing the programmable phase calibration device to reduce the phase mismatch in the pair of quadrature signals through **subtracting** a portion of the **first signal** from the **first signal** and **modifying** the **second signal** by **the portion of the first signal**" is neither taught nor suggested by the combined teaching of Wynn, Ozluturk, and Jeong. (*emphasis added*) Therefore, claim 4 should be found patentable over the prior art.

Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317) in view of Ozluturk et al. (US Publication 2002/0110201 A1).

Response:

Claim 7

In light of above statements, the applicant asserts that the claimed limitations "**subtracting** a portion of the **first signal** from **the first signal**" and ""**modifying** the **second signal** by **the portion of the first signal**" are neither taught nor suggested by the combined teaching of Wynn and Ozluturk. (*emphasis added*) Therefore, claim 7 should be found patentable over the prior art.

Claim 15

Claim 15 has been amended to clarify that the claimed complex filter can process image cross talk caused by mismatch between the first signal and the second signal. However, Ozluturk merely discloses that the low pass filters (33I, 33Q) time-average the received component symbols (23I, 23Q), and fails to teach or suggest, implicitly or explicitly, that the low pass filters (33I, 33Q) in Fig. 2 have the functionality of processing image cross talk caused by mismatch between the inphase signal and the quadrature signal. The applicant asserts that the claimed feature directed to the complex filter is not taught or suggested by the combined teaching of Wynn and Ozluturk. Therefore, claim 15 should be found allowable over the prior art.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Wiss (US Publication 2002/0097812 A1).

Response:

As shown in Fig. 5 and stated in specification paragraph [0058], Wiss discloses that the digitized I component is also multiplied by a circuit (16) having a variable coefficient C_1 being a function of phase imbalance loop, and the output of the circuit (16) is added to the digitized Q component to generate a rebalanced Q. Therefore, the applicant asserts that teachings of Wiss fail to teach or suggest the claimed limitation "**subtracting** a portion of the first signal from the first signal". (*emphasis added*) Therefore, claim 1 should be found patentable over Wiss.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317), in view of Wiss (US Publication 2002/0097812 A1), and further in view of Jeong (US Publication 2003/0095589 A1).

Response:

In light of above statements, the applicant asserts that the claimed limitation "utilizing the programmable phase calibration device to reduce the phase mismatch in the pair of quadrature signals through **subtracting** a portion of the first signal from the first signal and **modifying** the second signal by **the portion of the first signal**" is neither taught nor suggested by the combined teaching of Wynn, Wiss, and Jeong. (*emphasis added*) Therefore, claim 4 should be found patentable over the prior art.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wynn (US Patent 6,009,317) in view of Wiss (US Publication 2002/0097812 A1).

Response:

In light of above statements, the applicant asserts that the claimed limitation "**subtracting** a portion of the first signal from the first signal" is neither taught nor suggested by the combined teaching of Wynn and Wiss. (*emphasis added*) Therefore, claim 7 should be found patentable over the prior art.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Sincerely yours,

Winston Hsu Date: 10.23.2007

Winston Hsu, Patent Agent No. 41,526
P.O. BOX 506, Merrifield, VA 22116, U.S.A.
Voice Mail: 302-729-1562
Facsimile: 806-498-6673
e-mail : winstonhsu@naipo.com

Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)